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Immigrant Phytophagous Insects on Woody Plants in the United States and Canada: An Annotated List

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Since Europeans discovered North America about 500 years ago, there has been an ever increasing movement of plants and animals from other parts of the world to this continent (Sailer 1983, Frank and McCoy 1992, Niemela and Mattson 1992). For example, about 881 exotic plants have become established during this time in Canada, amounting to 28 percent of its total flora (Heywood 1989). The overall impact of these new arrivals on the ecology and the economy of North America has been profound (Gibbs and Wainhouse 1986, Dowell and Gill 1989, Liebhold *et al.* 1994), though not yet very well documented in the ecological literature or understood. Likewise 11,000-40,000 years ago, the arrival of Asian stone-age humans on the North American continent had a huge impact on the ecology of the New World (Krantz 1970, Martin 1973, Burney 1993). But these primitive humans were not as technologically advanced, and thus not as capable as modern humans of transporting large numbers of plants and animals with them. The intensity of the transfer of exotic organisms sharply increased with human capacity for speedy, long distance movement by water, so that most exotics have arrived within the last 100 years.

Sailer (1983) and Kim and McPheron (1993) reported that nearly 2,000 exotic insects and mites have become established in North America, but they did not specify the adopted hosts or habitats of such aliens. Because of the obvious, potential importance of exotic invertebrates and their associated plant pathogens in the structure and functioning of forest ecosystems, we present here the first annotated listing of all the immigrant phytophagous insect species that have become well established in North America on native and introduced woody plants (trees and shrubs).

METHODS

The insect species included in this list are those known to have been introduced from other continents and to have become permanently established in continental North America, north of Mexico. We compiled this list by searching many, diverse sources of available literature (see Literature Cited), and the NAIAD (North American Introduced Arthropod) computerized database managed by Dr. R.W. Carlson of the Smithsonian Institution, Washington, DC (Knutson *et al.* 1990). We present these data in an appendix showing all species complete with their ancillary information, and organized alphabetically by order, family, genus, and species. The included insects all feed on trees or shrubs for at least part of their life cycles, and have been recorded in the literature as new or introduced to North America. Neotropical species that are entering the southern states under their own power (Frank and McCoy 1992) and species believed to be successfully eradicated are not included. Appendix 1 contains the following ancillary information: region or continent of origin with specific country when known, host plant(s), pest status in North America, distribution in North America, place

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and date of first entry or first record in North America, ecological feeding guild based on plant tissues eaten, and diet-breadth or phagism. Individual species are classified as monophagous, oligophagous, or polyphagous depending on whether they feed on largely one genus, more than one genus in a single family, or more than one family of plants, respectively.

RESULTS

More than 368 species of exotic phytophagous insects have so far been introduced into and become established in North American (north of Mexico) forests, parks, woodlots, shelterbelts, and orchards (table 1). This is a very conservative estimate because our literature search was done during a single year, and we did not include species which were suspected but unsubstatiated immigrants. Surely the number will grow as more research is done. The four orders accounting for most of the introductions are Homoptera (115 species), Coleoptera (102 species), Lepidoptera (80 species), and Hymenoptera (38 species) (table 1). The two most important contributing families in each of these orders are Cicadellidae and Aphididae in the Homoptera; Curculionidae and Chysomelidae in the Coleoptera; Tortricidae and Geometridae in the Lepidoptera; and Tenthredinidae and Diprionidae in the Hymenoptera. The vast majority have come from the western Palearctic, i.e. Europe (266), and Asia (68) with only a handful from Africa (4) and Australia (3), or classified as of unknown origin (27) (table 2).

As might be expected, most belong to one of three feeding categories: (1) foliage chewers, (2) sap suckers, or (3) bark and wood borers (table 3). Contrary to the expectation that the majority of the successful plant-feeding immigrants would be generalist feeders, only about 37 percent are classified as polyphagous, 18 percent as oligophagous, and 44 percent as monophagous. Although these classifications are tentative owing to the lack of extensive data on the biology of exotics in their new environment, they suggest that many species that have a narrow diet breadth have still been remarkably successful in finding new, suitable hosts in North America. What this probably means is that most of the successful exotics exhibiting a narrow diet breadth in North America have come from a native environment that is similar to their newly adopted one (Gibbs and Wainhouse 1986, Niemela and Mattson 1992). Therefore, arriving in the New World may not have been particularly stressful for many species of insects because, fortuitously, close relatives of their former hosts were waiting for the invaders.

In fact, if one examines the hosts colonized in North America, one can see that virtually all exotic insects basically adopted a new plant species in the same genus as their ancestral host, or the very same species which had been planted and become wide spread in the New World (e.g., apples, eucalypts, etc.) (table 4). The top host genera supporting 25 or more exotics are as follows: *Prunus* (42), *Pinus* (37), *Salix* (36), *Malus* (35), *Betula* (34), *Quercus* (33), *Populus* (33), *Acer* (29), *Pyrus* (27), and *Picea* (26). Because the forests of North America, Eurasia, and East Central Asia have many plant genera and families in common (Rohrig and Ulrich 1991), insects from these regions ought to be particularly successful in cross-region transfers (Niemela and Mattson 1992). Hence, future successful immigrants to North American forests will likely come from these regions.

Table 1.—*Number of introduced species by order, organized in descending rank, and the number of species in different diet-breadth classes*

Insect order	Number in different diet-breadth classes				
	Total	Mono-	Oligo-	Poly-phagous	Unknown
Homoptera	115	71	17	27	
Coleoptera	102	24	18	56	4
Lepidoptera	80	27	14	39	
Hymenoptera	38	25	9	4	
Diptera	13	12	1	0	
Hemiptera	13	3	4	6	
Thysanoptera	4	0	2	2	
Orthoptera	1	0	0	1	
Isoptera	1	0	0	1	
Psocoptera	1	0	1	0	
Grand totals	368	162	66	136	4

Table 2.—*Number of introduced species from different continents/regions, and their frequency in different diet-breadth classifications*

Region/continent of exotic origin	Number of species in different diet-breadth classes			
	Total	Mono/Oligophagous	Polyphagous	Unknown
Europe	266	181 (68%)	85 (32%)	
Asia	68	29 (43%)	37 (54%)	2 (3%)
Africa	4	3 (75%)	1 (25%)	
Australia	3	2 (67%)	1 (33%)	
Unknown	27	13 (48%)	12 (44%)	2 (8%)

Table 3.—*Numbers*[1] *of introduced species in different feeding guild classes*

Feeding guild class	Number of species
A-Foliage feeders	130
B-Xylem, phloem feeders of stems, branches	69
C-Sap feeders (xylem, phloem, cell)	128
D-Gall formers	15
E-Fruit, cone, seed feeders	30
G-Root feeders	28
H-Bud feeders	11

[1] *Numbers total to more than the actual number of exotic insects (368) because some have more than one feeding habit and hence occur in more than one guild class. Does not include four (4) species of unknown guild.*

Table 4.—*Alphabetical listing of host plant genera adopted by exotic insects and the numbers of same in different diet-breadth classes on the different host plant genera*

Host genus	Number of exotic insect species feeding on genus	Number of species in phagy classes		
		Mono-	Oligo-	Poly-phagous
Abies	17	2	9	6
Acacia	1	0	-	1
Acer	29	10	-	19
Ailanthus	1	-	-	1
Albizzia	1	-	-	1
Alnus	24	7	1	16
Amelanchier	6	-	2	4
Anona	1	-	1	-
Ardisia	1	-	-	1
Artemisia	1	-	-	1
Azalea	1	1	-	-
Bambusa	5	5	-	-
Berberis	1	-	-	1
Betula	34	10	1	23
Buxus	3	2	-	1
Caragana	2	1	1	-
Carya	6	-	-	6
Carpinus	1	-	-	1
Cercocarpus	1	-	-	1
Castanea	3	-	-	3
Chamaecyparis	1	-	1	-
Citrus	9	-	-	9
Coccothrinax	1	-	1	-
Cornus	8	1	-	7
Corylus	10	2	-	8
Cotoneaster	2	-	1	1
Crataegus	22	2	7	13
Cupressus	1	-	1	-
Cycas	1	-	-	1
Cydonia	4	-	3	1
Eucalyptus	2	2	-	-
Eugenia	1	-	-	1
Euonymus	4	-	-	4
Fagus	10	3	-	7
Ficus	4	-	-	4
Forsythia	1	-	1	-
Fraxinus	10	1	1	8
Gleditsia	1	-	1	-
Ilex	9	1	-	8
Juglans	5	1	-	4
Juniperus	7	3	4	-
Kalmia	2	-	1	1
Kentia	1	-	-	1
Larix	12	3	6	3
Laurus	1	1	-	-
Ligustrum	10	2	2	6
Liquidambar	1	-	-	1
Lonicera	7	-	1	6

(table 4 continued on next page)

(table 4 continued)

Host genus	Number of exotic insect species feeding on genus	Number of species in phagy classes		
		Mono-	Oligo-	Poly-phagous
Magnolia	1	-	-	1
Malus	35	2	14	19
Mangifera	3	2	-	1
Manilkara	1	1	-	-
Morus	1	-	-	1
Nerium	1	-	-	1
Olea	2	-	1	1
Ostrya	1	-	-	1
Palmae	5	-	3	2
Pandanus	1	-	-	1
Persea	3	-	-	3
Phoenix	1	1	-	-
Phytelephas	1	-	-	1
Picea	26	5	14	7
Pinus	37	14	12	8
Plantago	1	1	-	-
Platanus	2	1	-	1
Populus	33	13	6	14
Prunus	42	10	7	25
Pseudotsuga	3	-	3	-
Punica	1	-	-	1
Pyrus	27	5	9	13
Quercus	33	4	-	29
Rhamnus	1	-	-	1
Rhizophora	2	2	-	-
Rhododendron	9	2	1	6
Ribes	9	4	2	3
Robinia	2	-	2	-
Rosa	5	3	-	2
Rubus	11	3	4	4
Sabal	2	-	1	1
Salix	36	8	6	22
Sambucus	1	-	-	1
Sorbus	4	1	2	1
Spirea	2	2	-	-
Stewartia	2	-	-	2
Swietenia	2	-	-	2
Symphoricarpus	1	-	-	1
Syringa	3	-	1	2
Tamarix	1	1	-	-
Taxus	7	-	2	5
Thea	1	-	-	1
Theobroma	1	-	-	1
Thuja	4	-	2	2
Thrinax	1	-	1	-
Tilia	9	2	-	7
Tsuga	8	1	3	4
Ulmus	24	13	-	11
Vaccinium	3	1	-	2
Viburnum	4	2	-	2
Wisteria	1	1	-	-

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APPENDIX 1

ANNOTATED LISTING OF EXOTIC PHYTOPHAGOUS INSECTS ON NORTH AMERICAN WOODY PLANTS

The following is the key to guild codes shown in the guild column, and to geographical abbreviations used in the following appendices.

Feeding guilds:

A. Foliage feeders
- a1- External lamina feeders (grazers)
- a2- Internal lamina feeders (miners)
- a3- Petiole miners

B. Phloem/xylem/pith feeders of stems/branches/roots
- b1- New, succulent shoot borers
- b2- Twig, branch, and terminal woody stem borers
- b3- Stem borers
- b4- Root borers
- b5- Stem, branch, twig, root girdlers (ext. feeders)
- b6-Wood products

C. Sap feeders (xylem, phloem, cell), piercing, sucking insects
- c1- Foliage feeders
- c2- Twig, branch feeders
- c3- Stem, root feeders
- c4- Bud feeders
- c5- Fruit and flower feeders

D. Gall formers
- d1- Leaf gall formers
- d2- Twig gall formers
- d3- Flower, fruit gall formers
- d4- Stem gall formers

E. Fruit, cone, seed feeders
- e1- Fruit and seed borers
- e2- Seed borers
- e3- Fruit grazers

G. Root feeders
- g1- Root grazers

H. Bud feeders
- h1- Bud borers
- h2- Bud grazers

Geographical abreviations used:

N.S.- Nova Scotia
Ott.- Ottawa
CAN - Canada
B.C.- British Columbia
Que.- Quebec
Manit.- Manitoba
Nfdl.- Newfoundland
P.E.I.-Prince Edward Island

Order:Family	Species name	Origin	Host plant	Guild	Phagy*
COLEOPTERA					
Anobiidae	Anobium punctatum (De Geer)	Europe	Wood products	b6	p
Anobiidae	Ernobius mollis (Linnaeus)	Europe	Conifers	b3	p
Anobiidae	Nicobium hirtum Iliger	Unknown	Wood products	b6	p
Anobiidae	Stegobium paniceum (Linnaeus)	Unknown	Wood products	b6	p
Anobiidae	Xestobium rufovillosum (De Geer)	Europe	Wood products	b6	p
Bostrichidae	Dinoderus minutus (Fabricius)	Europe ?	Bambusa	b6	m
Bostrichidae	Heterobostrychus aequalis (Waterhouse)	Asia	Quercus, Swietenia mahagoni	b6	p
Bostrichidae	Heterobostrychus hamatipennis (Lesne)	Asia	Unknown	b6	u
Bostrichidae	Sinoxyolon conigerum Gerst	Asia	Manilkara sapota	b2	m
Bostrichidae	Xylopsocus capucinus (Fabricius)	Asia	Tropical hardwoods	b2	p
Buprestidae	Agrilus aurichalceus Redtenbacher	Europe	Ribes, Rubus	b2 b3 d2	o
Buprestidae	Agrilus cyanescens Ratzeburg	Europe	Alnus, Betula, Fagus, Lonicera, Quercus, Rubus	b2 d2	p
Buprestidae	Agrilus pilosivittatus Saunders	Asia	Wisteria	b2 d2	m
Buprestidae	Agrilus sinuatus (Olivier)	Europe	Crataegus, Pyrus	b2 d2	o
Cerambycidae	Chlorophorus annularis (Fabricius)	Asia	Bambusa	b6	m
Cerambyicdae	Hylotrupes bajulus (Linnaeus)	Africa	Abies, Picea, Pinus, Tsuga	b6	o
Cerambycidae	Phoracantha semipunctata Fabricius	Australia	Eucalyptus	b3	m
Cerambycidae	Phymatodes lividus Rossi	Europe	Quercus, Ulmus	b2	p
Cerambycidae	Saperda populnea Linnaeus	Europe	Populus	d2	m
Chrysomelidae	Chrysomela crotchi Brown	Europe	Populus, Salix	a1	o
Chrysomelidae	Chrysomela interrupta (Fabricius)	Europe	Alnus	a1	m
Chrysomelidae	Lina laponica (Linnaeus)	Europe	Salix	a1	m
Chrysomelidae	Lina tremulae Fabricius	Europe	Populus	a1	m
Chrysomelidae	Plagiodera versicolora (Laich)	Europe	Populus, Salix	a1	o
Chrysomelidae	Psylliodes picina (Marsham)	Europe	Quercus	a1	m
Chrysomelidae	Pyrrhalta luteola (Mueller)	Europe	Salix, Ulmus	a1	p
Chrysomelidae	Pyrrhalta viburni (Paykull)	Europe	Viburnum	a1	m
Chrysomelidae	Zengophora scutellaris Suffrian	Europe	Populus	a1	m
Curculionidae	Brachyderes (Thylacites) incanus (Linnaeus)	Europe	Picea, Pinus	g1 a1	o
Curculionidae	Callirhopalus bifasciatus (Roelofs)	Asia	Ornamentals	g1 a1	p
Curculionidae	Calomycterus setarius Roelofs	Asia	Cotoneaster pyracantha, Sambucus canadensis	a1 g1	p
Curculionidae	Cryptorhynchus lapathi (Linnaeus)	Europe	Alnus, Betula, Populus, Salix	b2	p
Curculionidae	Cyrtepistomus castaneus (Roelofs)	Asia	Carya, Castanea, Cornus, Corylus, Fagus, Quercus	a1	p
Curculionidae	Elleschus bipunctatus (Linnaeus)	Europe	Salix	a1 g1	m
Curculionidae	Magdalis barbicornis (Latreille)	Europe	Cydonia, Malus	a1 g1	o
Curculionidae	Mecinus pyraster (Herbst)	Europe	Plantago	a1 g1	m
Curculionidae	Ochyromera ligustri Warner	Asia	Ligustrum	a1 g1	m
Curculionidae	Otiorhynchus clavipes Bonsdorff	Europe	Ligustrum, Lonicera, Rubus, Syringa, Viburnum	a1 g1	p
Curculionidae	Otiorhynchus ligneus Olivier	Europe	Prunus	a1 g1	m
Curculionidae	Otiorhynchus ligustri (Linneaus)	Europe	Malus, Prunus	a1 g1	o
Curculionidae	Otiorhynchus meridionalis (Gyllenhal)	Europe	Forsythia, Ligustrum, Olea, Syringa	a1	o
Curculionidae	Otiorhynchus ovatus (Linnaeus)	Europe	Picea, Pinus, Prunus, Taxus, Thuja, Tsuga	g1 b5	p
Curculionidae	Otiorhynchus raucus Fabricius	Europe	Malus, Pyrus	g1 a1	o
Curculionidae	Otiorhynchus rugosostriatus (Goeze)	Europe	Crataegus, Lonicera, Malus, Prunus, Pyrus, Quercus	g1	p
Curculionidae	Otiorhynchus scaber (Linnaeus)	Europe	Abies, Larix, Picea, Pinus, Quercus	g1 a1	p
Curculionidae	Otiorhynchus singularis (Linnaeus)	Europe	Abies, Alnus, Corylus, Fagus, Malus, Picea, Thuja	g1 a1	p

(continued on page 12)

First found	Date	N. Amer. distribution	Pest status	Source
Unknown	Unknown	Widely distributed	Damages furniture, homes	Drooz 1985
Unknown	<1900	Southeastern CAN to FL, TX	Attacks infested trees, minor	Drooz 1985
Southern U.S.	Unknown	Southern U.S.	Attacks treated wood, buildings	Drooz 1985
Unknown	Unknown	Throughout U.S.	Damages wood containers	Drooz 1985
Unknown	Unknown	Cosmopolitan	Damages wood products	Drooz 1985
Unknown	Unknown	FL, LA	Damages wood products	Drooz 1985, Joy 1976
FL	1967	FL	Serious pest of wood products	Drooz 1985
NC	1988	Unknown	Unknown	Frank & McCoy 1992
Unknown	Unknown	Unknown	Unknown	NAIAD
Unknown	Unknown	Unknown	Unknown	NAIAD
NJ	1923	U.S. wide	Unknown	NAIAD
WI	1920	MA, MI, WI, Ont.	Unknown	NAIAD, Bright 1987
Unknown	Unknown	Unknown	Unknown	NAIAD, Joy 1976
Unknown	Unknown	Unknown	Unknown	NAIAD, Joy 1976
Unknown	Unknown	Unknown	In bamboo products	Drooz 1985
Unknown	>1800	Eastern U.S.	Attacks seasoned wood	Drooz 1985
Unknown	Unknown	CA	Unknown	Dowell & Gill 1989
Unknown	Unknown	Unknown	Unknown	Schwenke 1974
Unknown	Unknown	West coast	Unknown	Furniss & Carolin 1977
Unknown	Unknown	Eastern U.S.	Unknown	Drooz 1985
Unknown	Unknown	Eastern U.S.	Unknown	Drooz 1985
Unknown	Unknown	Unknown	Unknown	NAIAD
Unknown	Unknown	Eastern U.S., CAN, Pacific Northwest, CA	Unknown	Milne & Milne 1980
Staten Island, NY	1915	Eastern U.S., southeastern CAN	Unknown	Drooz 1985
PA	1978	Unknown	Minor pest	Hoebeke & Wheeler 198
MD	1834	Widely distributed	May seriously damage urban elms	Drooz 1985
Unknown	Unknown	Unknown	Unknown	NAIAD
Unknown	Unknown	East of Rocky Mountains	Unknown	Drooz 1985
Unknown	1800?	Long Island, NY, MA	Minor pest	Drooz 1985
Philadelphia, PA	1914	Eastern U.S.	Unknown	Drooz 1985
Unknown	1929	Unknown	Unknown	NAIAD
NY	1882	U.S. and CAN	Serious pest of plantations, ornamentals	Drooz 1985
Montclair, NJ	1933	NJ to GA and MS	Defoliates saplings	Drooz 1985
Unknown	1916	Unknown	Minor pest	NAIAD
Unknown	1909	Unknown	Major pest	NAIAD
Unknown	1954	Unknown	Unknown	NAIAD
Unknown	1961	Unknown	Minor pest	NAIAD
Unknown	1942	Unknown	Unknown	NAIAD
Unknown	1917	Unknown	Minor pest	NAIAD
NY	1933	NY, Wolf's Island, CAN	Major pest	NAIAD, Schwenke 1972
CA	1931	Western U.S.	Minor pest	Warner & Negley 1976
Unknown	1852	U.S. and CAN	Root feeder	Drooz 1985
Unknown	<1957	Ont.	Nursery pest	Warner & Negley 1976
Unknown	1876	Western U.S.	Nursery pest	Furniss & Carolin 1977
N.S.	1957	N.S.	Unknown	Warner & Negley 1976
Unknown	1872	Eastern CAN, eastern U.S., B.C., WA	Major pest	Warner & Negley 1976

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Order:Family	Species name	Origin	Host plant	Guild	Phagy*
Curculionidae	Otiorhynchus sulcatus (Fabricius)	Europe	Picea, Rhododendron, Taxus, Tsuga	g1 b5 a1	p
Curculionidae	Phyllobius intrusus Kono	Asia	Juniperus, Thuja	g1	o
Curculionidae	Phyllobius oblongus (Linnaeus)	Europe	Acer saccharum, Alnus, Betula, Prunus, Ulmus	a1	p
Curculionidae	Polydrusus cervinus (Linnaeus)	Europe	Acer, Betula, Corylus, Quercus	a1 g1	p
Curculionidae	Polydrusus impressifrons Gyllenhal	Europe	Betula, Carya, Pinus, Populus, Quercus, Salix	g1 b5 a1	p
Curculionidae	Polydrusus sericeus Schaller	Europe	Abies, Larix, Picea	a1 g1	o
Curculionidae	Pselactus spadix (Herbst)	Europe	Acer, Salix	a1 g1	p
Curculionidae	Rhynchaenus alni (Linnaeus)	Europe	Alnus	a1 g1	m
Curculionidae	Sciaphilus asperatus Bonsdorff	Europe	Acer, Betula, Ostrya	g1 a1	p
Curculionidae	Sitona lineatus (Linnaeus)	Europe	Caragana, Robinia	a1 g1	o
Curculionidae	Strophosoma melanogrammus (Forster)	Europe	Betula, Corylus, Fagus, Pinus, Quercus	a1 g1	p
Eucnemidae	Dirrhagofarsus lewisi Fleutiaux	Asia	Fagus grandifolia	b3	m
Lyctidae	Lyctus brunneus (Stephens)	Europe	Wood products	b6	p
Lyctidae	Lyctus linearis (Goeze)	Europe	Wood products	b6	p
Oedemeridae	Nacerdes melanura (Linnaeus)	Europe	Wood products	b6	p
Ptilinidae	Ptilinus pectinicornis (Linnaeus)	Europe	Wood products	b6	p
Scarabaeidae	Anomala orientalis Waterhouse	Asia	Nursery stock	a1	p
Scarabaeidae	Maladera castanea (Arrow)	Asia	Hardwoods, conifers	a1	p
Scarabaeidae	Popillia japonica Newman	Asia	Trees and shrubs	a1	p
Scarabaeidae	Rhizotrogus majalis (Razoumowsky)	Europe	Picea, Pseudotsuga menziesii	g1	o
Scolytidae	Ambrosiodmus lewisi (Blandford)	Asia	Abies, Acer, Alnus, Carpinus, Morus, Quercus	b2	p
Scolytidae	Coccotrypes advena Blandford	Asia	Tropical trees w. lge fruits	b3 e1	p
Scolytidae	Coccotrypes carpophagus (Hornung)	Africa ?	Anona, Coccothrinax, Sabal, Thrinax	e2	o
Scolytidae	Coccotrypes cyperi (Beeson)	Asia	Eugenia, Mangifera, Persea, Phytelephas, Theobroma	e1 b3	?
Scolytidae	Coccotrypes dactyliperda (Fabricius)	Africa ?	Palmae	e2	o
Scolytidae	Coccotrypes distinctus (Motschulsky)	Asia	Palmae	e2	o
Scolytidae	Coccotrypes rhizophorae (Hopkins)	Asia	Rhizophora mangle	e2	m
Scolytidae	Coccotrypes vulgaris (Eggers)	Asia	Pinus, Sabal ?	e2	u
Scolytidae	Crypturgus pusillus (Gyllenhal)	Europe	Abies, Larix, Picea, Pinus	b3	o
Scolytidae	Hypocryphalus mangiferae (Stebbing)	Asia	Mangifera indica	b3	m
Scolytidae	Hypothenemus africanus (Hopkins)	Africa	Southern hardwoods	e2	p
Scolytidae	Hypothenemus areccae (Hornung)	Asia	Southern hardwoods	b3 e2	p
Scolytidae	Hypothenemus brunneus (Hopkins)	Africa ?	Southern hardwoods	b2	p
Scolytidae	Hypothenemus californicus Hopkins	Africa ?	Southern hardwoods	b2	p
Scolytidae	Hypothenemus crudiae (Panzer)	Asia	Southern hardwoods	e1	p
Scolytidae	Hypothenemus erectus LeConte	Africa ?	Southern hardwoods	e2	p
Scolytidae	Hypothenemus javanus (Eggers)	Africa ?	Southern hardwoods	b2	p
Scolytidae	Pityogenes bidentatus (Herbst)	Europe	Pinus	b3	m
Scolytidae	Premnobius cavipennis Eichhoff	Africa	Rhizophora	b3	m
Scolytidae	Scolytus mali (Bechstein)	Europe	Malus, Prunus, Pyrus, Ulmus	b3	p
Scolytidae	Scolytus multistriatus (Marsham)	Europe	Ulmus	b2	m
Scolytidae	Scolytus rugulosus (Mueller)	Europe	Crataegus, Cydonia, Malus, Prunus, Pyrus, Ulmus	b2	p
Scolytidae	Tomicus piniperda (Linnaeus)	Europe	Pinus	b3	m
Scolytidae	Xyleborinus saxeseni (Ratzeburg)	Europe	Hardwoods	b3	p
Scolytidae	Xyleborus affinis Eichoff	Asia	Albizzia, Betula, Carya, Castanea, Liquidambar	b3	p
Scolytidae	Xyleborus atratus Eichhoff	Europe	Hardwoods	b3	p

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First found	Date	N. Amer. distribution	Pest status	Source
Unknown	1831	U.S. and CAN	Pest in nurseries	Drooz 1985
RI	1947	NJ, NY, PA	Nursery pest	Drooz 1985
Rochester, NY	1923	NY, NJ, MI, PA	Minor pest	Drooz 1985
NH	1963	Unknown	Minor pest	Hoebeke & Wheeler 1983
NY	1906	NY, CT	Nursery and forest pest	Drooz 1985
Unknown	Unknown	Unknown	Unknown	Schwenke 1974, Joy 1976
Unknown	<1916	Unknown	Major pest	NAIAD
Unknown	1925	Unknown	Minor pest	NAIAD
N.S.	1884	Northeastern U.S., adjacent CAN	Unknown	Drooz 1985
Unknown	1936	Unknown	Major pest	NAIAD
Unknown	1885	Unknown	Unknown	NAIAD
MD	1976	MD	Unknown	Hoebeke & Wheeler 1983
Unknown	Unknown	Worldwide distribution	Serious pest	Drooz 1985
Unknown	Unknown	Western U.S.	Unknown	Furniss & Carolin 1977
Unknown	Unknown	Great Lakes coastline	Bores into wood in contact with water	Drooz 1985
NY	1961	Narrow distribution	Unknown	Drooz 1985
Unknown	1920	Unknown	Major pest	Drooz 1985
NJ	1921	Eastern U.S.	Defoliates young trees	Drooz 1985
NJ	1916	Eastern U.S.	Serious defoliator	Drooz 1985
NY	1940	Northeastern U.S., southern Ont.	Unknown	Drooz 1985
PA	1990	Unknown, possibly throughout eastern U.S.	Unknown	Hoebeke 1991
FL	1915	FL, Cuba	Unknown	Wood 1982
FL	1960	FL	Unknown	Wood 1982
FL and LA	1956	FL, LA	Unknown	Wood 1982
CA, AZ, TX, LA	1977	Southwestern U.S.	Unknown	Wood 1982
FL	1939	FL, LA, TX	Unknown	Wood 1982
FL	1918	FL	Unknown	Wood 1982
Unknown	Unknown	Unknown	Unknown	Atkinson *et al.* 1991
Unknown	Unknown	ME to NY to WV, eastern CAN	Attacks dead or dying trees	Drooz 1985
Unknown	1954	FL	Not an economic pest	Wood 1982
Unknown	Unknown	AL and LA	Unknown	Wood 1982
Unknown	Unknown	FL	Unknown	Wood 1982
Unknown	Unknown	FL, TX	Unknown	Wood 1982
Unknown	Unknown	Eastern U.S., NJ to FL and CA, TX	Unknown	Wood 1982
Unknown	Unknown	Southeastern U.S.	Unknown	Wood 1982
Unknown	Unknown	TX	Unknown	Wood 1982
Unknown	Unknown	FL	Unknown	Wood 1982
Unknown	Unknown	Northeastern U.S.	Serious pest	Hoebeke 1989
Unknown	Unknown	FL	Serious pest	Wood 1982, Bright 1987
Unknown	1868	Northeastern U.S., eastern CAN	Transmits Dutch elm disease	Drooz 1985
Boston, MA	1909	U.S. and CAN	Transmits Dutch elm disease	Drooz 1985
Unknown	1878	U.S. and CAN	Major pest	NAIAD, Wood 1982
Cleveland, OH	1992	OH	Pest of Christmas trees	Haack & Kucera 1993
Unknown	Unknown	Eastern North America	Serious pest	Wood 1982
Unknown	1817	Eastern U.S. west to TX	Unknown	NAIAD, Wood 1982
Unknown	Unknown	TN, GA, MD, VI, WV	Unknown	Atkinson *et al.* 1990

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Order:Family	Species name	Origin	Host plant	Guild	Phagy*
Scolytidae	Xyleborus dispar (Fabricius)	Europe	Acer, Betula, Castanea, Quercus	b3	p
Scolytidae	Xyleborus pelliculosus Eichhoff	Asia	Hardwoods	b3	p
Scolytidae	Xyleborus rubricollis Eichhoff	Asia	Carya, Cornus, Juglans, Quercus	b3	p
Scolytidae	Xyleborus validus Eichhoff	Asia	Abies, Fagus, Picea, Quercus	b2	p
Scolytidae	Xylosandrus compactus (Eichhoff)	Asia	Ardisia, Ficus, Persea, Swietenia, other hardwoods	b2	p
Scolytidae	Xylosandrus crassiusculus (Motschulsky)	Asia	Hardwoods	b6 b3	p
Scolytidae	Xylosandrus germanus (Blandford)	Asia	Acer, Carya, Cornus, Fagus, Fraxinus, Juglans, Pinus, Prunus, Pyrus, Quercus, Ulmus	b3	p
Silvanidae	Silvanoprus scuticollis (Walker)	Asia ?	Citrus, Pinus ?	b3	u
Silvanidae	Silvanus recticollis Reitter	Europe ?	Citrus, Pinus ?	b3	u
Tenebrionidae	Tenebroides mauritanicus (Linnaeus)	Unknown	Wood products	b6	p
DIPTERA					
Agromyzidae	Paraphytomyza populicola (Walker)	Europe	Populus	a2	m
Agromyzidae	Phytomyza ilicis Curtis	Europe	Ilex	a2	m
Anthomyiidae	Hylemya platura (Meigen)	Europe	Conifers	g1	o
Cecidomyiidae	Contarinia baeri (Prell)	Europe	Pinus resinosa, P. sylvestris	a1	m
Cecidomyiidae	Continarinea pyrivora (Riley)	Europe	Pyrus	d1	m
Cecidomyiidae	Dasineura mali (Keiffer)	Europe	Malus	a2	m
Cecidomyiidae	Dasineura pyri (Bouche)	Europe	Pyrus communis	a2	m
Cecidomyiidae	Monarthropalpus buxi Laboulbene	Europe	Buxus	a2	m
Cecidomyiidae	Monarthropalpus flavus (Schrank)	Europe	Buxus	d1	m
Cecidomyiidae	Rhabdophaga salicis Schrank	Europe	Salix	d2	m
Cecidomyiidae	Semudobia betulae (Winnertz)	Europe	Betula pendula	d1	m
Cecidomyiidae	Semudobia tarda Roskam	Europe	Betula pendula	d1	m
Tephritidae	Rhagoletis completa Cresson	Unknown	Juglans	e2	m
HEMIPTERA					
Miridae	Camptozygum aequale (Villers)	Europe	Abies, Juniperus, Picea, Pinus	c1	o
Miridae	Capsus ater (Linnaeus)	Europe	Spirea ulmaria	c1	m
Miridae	Dicyphus rhododendri Dolling	Europe	Kalmia latifolia, Rhododendron	c1	o
Miridae	Orthotylus nassatus (Fabricius)	Europe	Fraxinus, Quercus, Salix, Tilia	c1	p
Miridae	Orthotylus viridinervis Kirschbaum	Europe	Alnus, Corylus, Quercus, Salix, Ulmus	c1	p
Miridae	Pilophorus clavatus (Linnaeus)	Europe	Alnus, Betula, Corylus, Populus, Quercus, Salix	c1	p
Miridae	Pilophorus confusus (Kirschbaum)	Europe	Alnus, Crataegus, Populus, Ribes, Salix, Tilia	c1	p
Miridae	Pinalitus rubricatus (Fallen)	Europe	Abies, Larix, Picea, Pinus	c1	o
Miridae	Plagiognathus vitellinus (Scholtz)	Europe	Larix, Picea, Pinus	c1	o
Miridae	Psallus variabilis (Fallen)	Europe	Populus, Salix, Tilia, also feeds on small insects	c1	p
Miridae	Stenarus dissimilis Reuter	Europe	Abies	c1	m
Miridae	Stenarus rotermundi (Scholtz)	Europe	Alnus glutinosa, Populus alba, P. canadensis	c1	p
Tingidae	Stephanitis rhododendri Horvath	Europe	Rhododendron	c1	m
HOMOPTERA					
Adelgidae	Adelges abietis (Linnaeus)	Europe	Picea	d2	m
Adelgidae	Adelges laricis Vallot	Europe	Larix, Picea	c1 d2	o
Adelgidae	Adelges nusslini (Borner)	Europe	Abies, Picea	c1 d2	o

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First found	Date	N. Amer. distribution	Pest status	Source
Unknown	1817	U.S. and CAN	Attacks weakened hardwoods	Furniss & Carolin 1977
Unknown	Unknown	PA, MD	Unknown	Atkinson *et al.* 1990
MD	1942	Eastern North America	Minor pest	Drooz 1985, Wood 1982
Unknown	Unknown	NY to PA	Attacks dead or dying branches	Drooz 1985, Wood 1982
FL, Cuba	1941	FL, GA to LA	Pest of ornamentals	Drooz 1985, Wood 1982
Charleston, SC	1975	SC	Attacks seedlings, new-cut logs	Drooz 1985, Wood 1982
Unknown	1932	CT and NJ west to IL and KT	Transmits Dutch elm disease	Drooz 1985, Wood 1982
Unknown	Unknown	FL, GA, NC	Unknown	Frank & McCoy 1992
Unknown	Unknown	FL	Unknown	Frank & McCoy 1992
Unknown	<1820	Widely distributed	Grain and wood products	Drooz 1985
Ott.	1956	Que., Ont.	Unknown	Spencer 1969
Unknown	Unknown	West coast of U.S.	Unknown	Furniss & Carolin 1977
Unknown	1849	Northwestern U.S.	Unknown	Furniss & Carolin 1977
CAN	ca 1960	Ont., N.B., Que.	Causes needle death	Martineau 1984
CT	1877	Northeastern U.S., eastern CAN	Unknown	Gagne 1989
MA	1928	N.B., New England states, NY	Causes leaf drop	Gagne 1989
CT	1927	CT, NY	Causes leaf drop	Gagne 1989
Unknown	Unknown	RI to MD and DE	Causes leaf drop	Drooz 1985
Unknown	Unknown	NY to VI, MI, CA	Unknown	Gagne 1989
Unknown	Unknown	Unknown	Unknown	Rose & Lindquist 1982
Unknown	Unknown	Ont., PA	Unknown	Gagne 1989
Unknown	Unknown	Que., MT, ID	Unknown	Gagne 1989
Unknown	Unknown	Central U.S. states	Bores into the husk of nuts	Drooz 1985
PA	<1938	Unknown	Minor pest	Hoebeke & Wheeler 1983
Unknown	Unknown	Unknown	Minor pest	NAIAD
OH	1933	Unknown	Minor pest	Hoebeke & Wheeler 1983
PA	1973	Unknown	Minor pest	Hoebeke & Wheeler 1983
Ont., CAN	1937	Unknown	Minor pest	Hoebeke & Wheeler 1983
Unknown	1887	Unknown	Unknown	NAIAD
N.S.	1976	Unknown	No economic damage	Hoebeke & Wheeler 1983
PA	1974	Unknown	Unknown	Hoebeke & Wheeler 1983
PA	1972	Unknown	Minor pest	Hoebeke & Wheeler 1983
Long Island, NY	1979	Unknown	No economic damage	Hoebeke & Wheeler 1983
PA	1973	Unknown	Minor pest	Hoebeke & Wheeler 1983
PA	1977	Unknown	Minor pest	Hoebeke & Wheeler 1983
Unknown	1904	Unknown	Minor pest	Drooz 1985, NAIAD
Unknown	1881	Southeastern CAN, northeastern U.S., Great Lakes region	Serious pest in nurseries, parks, plantations	Drooz 1985
Unknown	1895	Eastern Canada, northeastern U.S.	Unknown	Drooz 1985
B.C.	Unknown	B.C., CA	Pest of ornamentals	Furniss & Carolin 1977

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Order:Family	Species name	Origin	Host plant	Guild	Phagy*
Adelgidae	Adelges piceae (Ratzeburg)	Europe	Abies	c2	m
Adelgidae	Adelges tsugae Annand	Asia	Tsuga	c2	m
Adelgidae	Eopineus pineoides (Cholodkowskij)	Europe	Picea abies	c2 c3	m
Adelgidae	Pineus boerneri Annand	Unknown	Pinus	c2	m
Aleyrodidae	Aleurotrachelus jelenekii (Frauenfeld)	Europe	Viburnum	c1	m
Aleyrodidae	Dialeurodes chittendeni Laing	Asia	Rhododendron	c1	m
Aleyrodidae	Pealius azaleae (Bean and Moles)	Asia	Azalea	c1	m
Aphididae	Acyrthosiphon caraganae (Cholodkovsky)	Europe	Caragana	c1	m
Aphididae	Amphorophora picridis Boerner	Europe	Ribes	c1	m
Aphididae	Anoecia corni (Fabricius)	Europe	Cornus	g1 ?	m
Aphididae	Aphis cytisorum Hartig	Europe	Woody Leguminosae	c	o
Aphididae	Aphis pomi DeGeer	Europe	Cotoneaster, Crataegus, Malus, Pyrus	c1	o
Aphididae	Chaetoporella aceris (Linnaeus)	Europe	Acer	c1	m
Aphididae	Cinara thujafilina (Del Guercio)	Europe	Chamaecyparis, Cupressus, Thuja	c3	o
Aphididae	Elatobium abietinum (Walker)	Europe	Picea, Pinus, Pseudotsuga	c1	o
Aphididae	Euceraphis punctipennis (Zetterstedt)	Europe	Betula	c1	m
Aphididae	Hyadaphis tataricae (Aizenberg)	Europe	Lonicera, Rhododendron	c1	p
Aphididae	Periphyllus californiensis (Shinji)	Asia	Acer	c1	m
Aphididae	Periphyllus testudinacea (Fernie)	Europe	Acer	c1	m
Aphididae	Phyllaphis fagi (Linnaeus)	Europe	Fagus silvatica, Fagus grandifolia	c1	m
Aphididae	Rhopalosiphum padi (Linnaeus)	Europe	Prunus	c1	m
Aphididae	Schizolachnus pineti (F.)	Europe	Pinus	c1	m
Aphididae	Tinocallis saltans (Nevsky)	Asia	Ulmus	c1	m
Asterolecaniidae	Asterolecanium minus Lindinger	Europe	Quercus	d2	m
Asterolecaniidae	Asterolecanium variolosum (Ratzeburg)	Europe	Amelanchier, Prunus, Quercus	c2	p
Cercopidae	Aphrophora alni (Fallen)	Europe	Alnus rugosa	c1	p
Cicadellidae	Aguriahana stellulata (Burmeister)	Europe	Prunus, Tilia	c1	p
Cicadellidae	Allygus mixtus (Fabricius)	Europe	Quercus (esp. garryana)	c1	m
Cicadellidae	Empoasca bipunctata (Osh.)	Asia	Ulmus pumila	c1	m
Cicadellidae	Empoasca luda Davidson & DeLong	Europe	Betula alba, B. pendula	c1	m
Cicadellidae	Empoasca populi Edwards	Europe	Populus	c1	m
Cicadellidae	Empoasca smaragdula (Fallen)	Europe	Alnus	c1	m
Cicadellidae	Fieberiella florii (Stal)	Europe	Ligustrum	c1	m
Cicadellidae	Grypotes puncticollis (Herrich-Schaeffer)	Europe	Pinus sylvestris, P. mugo	c1	m
Cicadellidae	Idiocerus cognatus Fieber	Europe	Populus alba	c1	m
Cicadellidae	Idiocerus stigmaticalis Lewis	Europe	Salix fragilis, S. alba	c1	m
Cicadellidae	Japananus hyalinus (Osborn)	Asia	Acer	c1	m
Cicadellidae	Macropsis fuscula (Zetterstedt)	Europe	Rubus	c1	m
Cicadellidae	Macropsis graminea (Fabricius)	Europe	Populus nigra	c1	m
Cicadellidae	Macropsis mendax (Fieber)	Europe	Ulmus	c1	m
Cicadellidae	Macropsis notata (Prohaska)	Europe	Salix	c1	m
Cicadellidae	Macropsis ocellata Provancher	Europe	Salix alba	c1	m
Cicadellidae	Macropsis ulmi (Scott)	Europe	Ulmus	c1	m
Cicadellidae	Macropsis vicina (Horvath)	Europe	Populus alba	c1	m
Cicadellidae	Oncopsis tristis (Zetterstedt)	Europe	Betula	c1	m
Cicadellidae	Opsius stactogalus Fieber	Europe	Tamarix	c1	m
Cicadellidae	Orientis ishidae (Matsumura)	Asia	Trees and shrubs	c1	p

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First found	Date	N. Amer. distribution	Pest status	Source
New Brunswick, ME	1908	Canadian Maritime Provinces, northeastern U.S., southern Appalachians, Pacific Northwest	Serious pest	Drooz 1985
Northwest U.S.	Unknown	VI to MA, Pacific Northwest	Serious pest, kills hemlock	Drooz 1985
Unknown	Unknown	Unknown	Unknown	Schwenke 1972
NY	1939	CT, MD, RI, CA	Kills red pine in plantations	Furniss & Carolin 1977
Unknown	Unknown	Unknown	Unknown	NAIAD
Unknown	Unknown	WA, B.C.	Pest of ornamentals	Furniss & Carolin 1977
Unknown	Unknown	Southeastern U.S. north to OH	Pest of ornamentals	Drooz 1985
Unknown	<1900	Canadian prairie provinces	Unknown	Ives & Wong 1988
Unknown	Unknown	Unknown	Unknown	NAIAD
Unknown	Unknown	Unknown	Unknown	NAIAD
Unknown	<1906	Unknown	Unknown	Robinson 1991
Unknown	Unknown	Unknown	Major pest in orchards	Milne & Milne 1980
Unknown	Unknown	CA, OR, WA, B.C., CO, UT	Unknown	Furniss & Carolin 1977
Unknown	Unknown	Southern CA	Pest of ornamentals	Furniss & Carolin 1977
Unknown	Unknown	Pacific coast, AK to CA	Causes extensive spruce mortality	Furniss & Carolin 1977
Unknown	Unknown	B.C., OR, WA, CA to CO	Unknown	Furniss & Carolin 1977
Montreal, CAN	1975	Montreal to Alberta, Great Lake states	Serious pest	Voegtlin 1981
Unknown	Unknown	CA to B.C.	Unknown	Furniss & Carolin 1977
Unknown	Unknown	AK, B.C., WA, OR, CA	Unknown	Furniss & Carolin 1977
Unknown	Unknown	Unknown	Unknown	Schwenke 1972
Unknown	Unknown	Unknown	Unknown	NAIAD
Unknown	Unknown	CA, OR	Unknown	Furniss & Carolin 1977
ID	1986	Unknown	Unknown	Halbert & Pike 1990
Unknown	Unknown	Western U.S.	Kills twigs and branches	Furniss & Carolin 1977
Unknown	Unknown	Unknown	May cause twig dieback on oaks	Drooz 1985
Monroe Co., MI	1966	Ont., MI	Unknown	Wheeler 1992
New Haven, CT	1920	Ont., New England	Unknown	Hamilton 1983
Medford, MA	1919	N.S., B.C.	Unknown	Hamilton 1983
PA	1930	Elm range in N. America	Unknown	Hamilton 1983
Unknown	Unknown	OH, IL, Ont., B.C.	Unknown	Hamilton 1983
N.S.	1969	N.S.	Unknown	Hamilton 1983
Vancouver, B.C.	1976	Unknown	Unknown	Hamilton 1983
New Caanan, CT	1918	CT, MA, NJ, Ont., NC, IL, CA, WA, B.C.	Unknown	Hamilton 1983
Unknown	Unknown	NY, PA, MI, OH	Unknown	Wheeler 1992
Irvington, NJ	1917	Eastern U.S.	Unknown	Hamilton 1983
Forest Hills, MA	1969	Eastern Canada, eastern U.S.	Unknown	Hamilton 1983
Washington, DC	1897	PA, NJ, CT, NC, OH, IL, TN, MS, Ont., OR	Unknown	Hamilton 1983
Vancouver, B.C.	1950	West coast from B.C. to WA, Ont.	Unknown	Hamilton 1983
NJ	ca 1918	host range	Unknown	Hamilton 1983
Washington, DC	1892	D.C. to Ont. to WI, San Jose, CA	Unknown	Hamilton 1983
Rye, NH	1922	NH, N.B.	Unknown	Hamilton 1983
Que.	ca 1872	Eastern U.S., TX	Unknown	Hamilton 1983
NY & McCord A.F.B., WA	1977	Unknown	Unknown	Hamilton 1983
Ont.	1974	Unknown	Unknown	Hamilton 1983
Vancouver, B.C.	1976	Unknown	Unknown	Hamilton 1983
TX	ca 1907	Eastern U.S., southern U.S., Ont., west to CA, B.C.	Unknown	Hamilton 1983
NJ	ca 1919	Ont., NJ, MD, PA, NH, OH	Unknown	Hamilton 1983

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Order:Family	Species name	Origin	Host plant	Guild	Phagy*
Cicadellidae	Pediopsis tiliae (Germar)	Europe	Tilia	c1	m
Cicadellidae	Rhytidodus decimasquartus (Schrank)	Europe	Populus nigra	c1	m
Cicadellidae	Ribautiana tenerrima (Herrich-Schaeffer)	Europe	Rubus	c1	m
Cicadellidae	Ribautiana ulmi (Linnaeus)	Europe	Ulmus	c1	m
Cicadellidae	Typhlocyba avellanae Edwards	Europe	Corylus	c1	m
Cicadellidae	Typhlocyba barbata Ribaut	Europe	Salix	c1	m
Cicadellidae	Typhlocyba candidula Kirshbaum	Europe	Betula alba	c1	m
Cicadellidae	Typhlocyba froggatti Baker	Europe	Crataegus, Malus	c1	o
Cicadellidae	Typhlocyba frustrator Edwards	Europe	Corylus	c1	m
Cicadellidae	Typhlocyba hippocastani Edwards	Europe	Ulmus	c1	m
Cicadellidae	Typhlocyba lethierryi Edwards	Europe	Acer platanoides	c1	m
Cicadellidae	Typhlocyba nigriloba Edwards	Europe	Platanus occidentalis	c1	m
Cicadellidae	Typhlocyba plebeja Edwards	Europe	Ulmus glabra	c1	m
Cicadellidae	Typhlocyba prunicola Edwards	Europe	Prunus, Rubus	c1	o
Cicadellidae	Typhlocyba quercus (Fabricius)	Europe	Trees and shrubs	c1	p
Cicadellidae	Zygina flammingera (Fourcroy)	Europe	Prunus	c1	m
Coccidae	Ceroplastes ceriferus (F.)	Asia	Euonymus, Ilex, Stewartia, Tsuga	c1	p
Coccidae	Eulecanium cerasorum (Cockerell)	Asia	Acer, Cornus, deciduous ornamentals	c1	p
Coccidae	Eulecanium coryli (Linnaeus)	Europe	Hardwoods	c2	p
Coccidae	Physokermes picea (Schrank)	Europe	Picea	c4	m
Diaspididae	Aonidia lauri (Bouche)	Europe	Laurus	c2	m
Diaspididae	Aonidiella aurantii (Maskell)	Asia	Citrus, Ficus, Ligustrum, Olea	c1 c2 c5	p
Diaspididae	Aonidiella citrina (Coquillett)	Asia	Citrus, Cycas, Euonymus, Ligustrum	c1 c2 c5	p
Diaspididae	Aonidiella orientalis (Newstead)	Asia	Tropical hardwoods	c1	p
Diaspididae	Aspidiotus destructor Signoret	Asia	Pandanus, Palmae	c1 c2 c5	?
Diaspididae	Aspidiotus nerii Bouche	Asia ?	Tropical hardwoods	c1 c2 c5	p
Diaspididae	Carulaspis juniperi (Bouche)	Europe	Conifers	c1	o
Diaspididae	Carulaspis minima (Targioni-Tozzetti)	Asia	Conifers	c1 c2	o
Diaspididae	Chrysomphalus aonidium (L.)	Asia	Citrus, Ilex, Palmae	c1 c2 c5	p
Diaspididae	Chrysomphalus dictyospermi (Morgan)	Africa ?	Citrus, Ficus, Kentia, Persea	c1	p
Diaspididae	Dynaspidiotus britannicus (Newstead)	Europe	Berberis, Ilex, Rhamnus, Viburnum	c1	p
Diaspididae	Fiorinia externa Ferris	Asia	Abies, Picea, Taxus, Tsuga	c1	o
Diaspididae	Fiorinia theae Green	Asia	Citrus, Cornus, Ficus, Ilex, Stewartia	c1	p
Diaspididae	Kuwanaspis pseudoleucaspis (Kuwana)	Asia	Bambusa	c2	m
Diaspididae	Lepidosaphes ulmi (L.)	Europe	Acer, Betula, Platanus, Populus, Salix	c2	p
Diaspididae	Lopholeucaspis japonica (Cockerell)	Asia	Acer, Buxus, Citrus, Fraxinus, Magnolia	c1 c2	p
Diaspididae	Morganella longispina (Morgan)	Asia	Nerium oleander	c1	m
Diaspididae	Mytilococcus (Lepidosaphes) newsteadi (Sulc)	Unknown	Abies, Pinus	c2	o
Diaspididae	Nilotaspis halli (Green)	Europe ?	Prunus	b3	m
Diaspididae	Nuculaspis tsugae (Marlatt)	Asia	Abies, Juniperus, Picea, Taxus, Tsuga	c1	o
Diaspididae	Odonaspis penicillata Green	Asia	Bambusa	c3	m
Diaspididae	Pinnaspis strachani (Cooley)	Unknown	Ornamentals	c1 c2	p
Diaspididae	Pseudaonidia duplex (Cockerell)	Asia	Hardwoods	c1 c2	p
Diaspididae	Pseudaonidia paeoniae (Cockerell)	Asia	Ilex, Rhododendron, Thea	c2	p
Diaspididae	Quadraspidiotus gigas (Thiem and Gerneck)	Unknown	Populus, Salix	c2	o
Diaspididae	Quadraspidiotus perniciosus (Comstock)	Asia	Rosaceae	c1 c3 c5	o
Diaspididae	Radiaspis (Leucaspis) indica (Marlatt)	Asia	Mangifera	c2	m
Eriococcidae	Cryptococcus fagisuga Lindinger	Europe	Fagus grandifolia	c2	m

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First found	Date	N. Amer. distribution	Pest status	Source
New Haven, CT	1934	CT, Ont.	Unknown	Hamilton 1983
New Haven, CT	1909	CT, OH, Ont., IN, IL, KY, B.C., CA	Unknown	Hamilton 1983
B.C.	1947	B.C. coast	Unknown	Hamilton 1983
Albany, NY	1886	NY, MA, IA, MS, N.S., Ont., B.C., CA	Unknown	Hamilton 1983
Victoria, B.C.	1950	Unknown	Unknown	Hamilton 1983
Summerland, B.C.	1970	Unknown	Unknown	Hamilton 1983
ME	ca 1943	MN, NH, CT, OR, Ont., B.C.	Unknown	Hamilton 1983
OH, NY, MA	ca 1926	OH, NY, MA, UT, Ont.	Unknown	Hamilton 1983
McMinnville, OR	1946	OR, WA, B.C.	Unknown	Hamilton 1983
Que.	ca 1950	Que., N.S.	Unknown	Hamilton 1983
Unknown	Unknown	N.S. to WI, B.C.	Unknown	Hamilton 1983
Halifax, N.S.	1966	Unknown	Unknown	Hamilton 1983
Wood's Hole, MA	1900	MA, NY, Washington, D.C., OH, B.C.	Unknown	Hamilton 1983
Albany, NY	1900	ID, WA, CA, UT, B.C.	Unknown	Hamilton 1983
Vancouver, B.C.	1946	B.C., CA, N.S.	Unknown	Hamilton 1983
Vancouver, B.C.	1950	B.C., WA	Unknown	Hamilton 1983
Unknown	Unknown	NY to FL, west to TX	Minor pest of ornamentals	Drooz 1985
Unknown	Unknown	Atlantic Coast states	Minor pest	Drooz 1985
Unknown	Unknown	Unknown	Unknown	Schwenke 1972
Unknown	Unknown	Midwestern and eastern U.S.	May kill lower branches	Drooz 1985
Unknown	1907	Unknown	Minor pest	NAIAD
Unknown	<1875	FL, CA	Economically important	Dekle 1976, Ferris 1938, NAIAD
Unknown	1890	CA, FL, TX	Economically important	Dekle 1976, Ferris 1938, NAIAD
Unknown	Unknown	FL	Economically important	Ferris 1938
Unknown	Unknown	FL	Occasionally serious pest	Dekle 1976, Ferris 1938
Unknown	Unknown	Southeastern U.S.	Minor pest of ornamentals	Dekle 1976, Drooz 1985
Unknown	Unknown	U.S.	Unknown	Drooz 1985
Unknown	Unknown	U.S.	Pest of nurseries	Dekle 1976, Drooz 1985
Unknown	Unknown	FL	Pest of ornamentals	Dekle 1976, Drooz 1985
Unknown	Unknown	CA, FL, MS, LA	Pest of nurseries and citrus groves	Dekle 1976, Ferris 1938
Unknown	Unknown	OR, CT, MA, B.C.	Unknown	Ferris 1938
Unknown	Unknown	Eastern U.S.	Serious pest of hemlock	Drooz 1985
Unknown	Unknown	MD to FL, west to LA	Unknown	Dekle 1976, Drooz 1985
Unknown	Unknown	CA	Not economically important	Ferris 1941
Unknown	Unknown	U.S.	Serious pest	Drooz 1985
Unknown	Unknown	Atlantic Coast states	May kill branches	Drooz 1985, Ferris 1938
Unknown	1980	Unknown	Foliage scale	Frank & McCoy 1992
Unknown	Unknown	Unknown	Unknown	Ferris 1938
Unknown	Unknown	CA	Unknown	Ferris 1941
Unknown	Unknown	CT, MD, NJ, and RI	May kill trees along with elongate hemlock scale	Drooz 1985
Unknown	Unknown	CA, LA, MS	Unknown	Ferris 1938
Unknown	Unknown	Southeastern U.S.	Unknown	Drooz 1985
Unknown	Unknown	Southeastern U.S.	Kills lower branches	Drooz 1985
Unknown	Unknown	NY to FL, west to LA	Unknown	Drooz 1985
Unknown	Unknown	NY, OH, PA, RI, WI	May kill trees	Drooz 1985
Unknown	Unknown	U.S.	Serious pest	Drooz 1985
Unknown	Unknown	CA, FL	Unknown	Ferris 1938
Halifax, N.S.	ca 1890	Northeastern U.S., CAN	Serious pest along with a fungus	Drooz 1985

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Order:Family	Species name	Origin	Host plant	Guild	Phagy*
Eriococcidae	Eriococcus azaleae Comstock	Europe	Acer, Populus, Rhododendron, Salix	b2	p
Eriococcidae	Gossyparia spuria (Modeer)	Europe	Ulmus	c1 c2	m
Eriosomatidae	Eriosoma ulmi (Linnaeus)	Europe	Ulmus	c1	m
Eriosomatidae	Pemphigus bursarius (L.)	Europe	Populus	c1	m
Margarodidae	Icerya purchasi Maskell	Australia	Acacia, Citrus, s. Hardwoods	c1	p
Margarodidae	Matsucoccus resinosea Bean & Godwin	Europe	Pinus resinosa	c2	m
Pemphigidae	Schizoneura languinosa Hartig	Europe	Ulmus	c	m
Pseudococcidae	Antonina pretiosa Ferris	Asia	Bambusa	c3	m
Pseudococcidae	Dysmicoccus wistariae (Green)	Unknown	Acer, Cornus, Prunus, Rhododendron, Taxus	c1	p
Pseudococcidae	Phenacoccus acericola King	Europe	Acer	c1	m
Pseudococcidae	Phenacoccus aceris (Signoret)	Europe	Rosaceae	c1	o
Pseudococcidae	Pseudococcus comstocki (Kuwana)	Asia	Hardwoods	c1	p
Psyllidae	Ctenarytaina eucalypti (Froggatt)	Australia	Eucalyptus	c1	m
Psyllidae	Psylla mali (Schmidberger)	Europe	Cydonia, Malus, Prunus, Sorbus aucuparia	c1	o
Psyllidae	Psylla pyricola Foerster	Europe	Pyrus	c1	m
Psyllidae	Psyllopsis fraxinicola (Forster)	Europe	Fraxinus	c1	m
HYMENOPTERA					
Argidae	Arge ochropa (Gmelin)	Europe	Rosa	a1	m
Cimbicidae	Zaraea lonicerae (Linnaeus)	Europe	Lonicera, Symphoricarpos	a1	o
Diprionidae	Diprion similis (Hartig)	Europe	Pinus	c1	m
Diprionidae	Gilpinia frutetorum (Fabricius)	Europe	Pinus	a1	m
Diprionidae	Gilpinia hercyniae (Hartig)	Europe	Picea	a1	m
Diprionidae	Gilpinia viminalis (Fallen)	Europe	Populus, Salix	a1	o
Diprionidae	Neodiprion sertifer (Geoffroy)	Europe	Pinus	a1	m
Pamphiliidae	Acantholyda erythrocephala (Linnaeus)	Europe	Pinus resinosa, P. strobus	a1	m
Siricidae	Eriotremex formosanus (Matsumura)	Asia	Quercus, hardwoods	b3	p
Siricidae	Sirex juvencus juvencus (Linnaeus)	Europe	Abies, Picea, Pinus	b3	o
Siricidae	Sirex noctilio Fabricius	Europe	Larix, Pinus, Pseudotsuga	b3	o
Tenthredinidae	Allantus basalis (Klug)	Europe	Rosa	a1	m
Tenthredinidae	Allantus cinctus (Linnaeus)	Europe ?	Rosa	a1	m
Tenthredinidae	Allantus viennensis (Schrank)	Europe	Ribes, Rosa, Rubus	a1	o
Tenthredinidae	Caliroa cerasi (Linnaeus)	Europe	Amelanchier, Crataegus, Fraxinus, Prunus, Pyrus	a1	p
Tenthredinidae	Caulocampus acericaulis (MacGillivray)	Unknown	Acer	a3	m
Tenthredinidae	Croesus varus (Villaret)	Europe	Alnus	a1	m
Tenthredinidae	Eriocampa ovata (Linnaeus)	Europe	Alnus rubra	a1	m
Tenthredinidae	Eupareophora parca	Unknown	Fraxinus	a1	m
Tenthredinidae	Fenusa dohrnii (Tischbein)	Europe	Alnus	a2	m
Tenthredinidae	Fenusa pusilla (Lepeletier)	Europe	Betula	a2	m
Tenthredinidae	Fenusa ulmi Sundevall	Europe	Ulmus	a2	m
Tenthredinidae	Hemichroa crocea (Geoffroy)	Europe	Alnus	a1	m
Tenthredinidae	Heterarthrus nemoratus (Fallen)	Europe	Betula	a2	m
Tenthredinidae	Hoplocampa brevis (Klug)	Europe	Pyrus	e1	m

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First found	Date	N. Amer. distribution	Pest status	Source
Unknown	Unknown	Eastern U.S.	Causes dieback	Drooz 1985
Unknown	Unknown	Entire elm range	Unknown	Drooz 1985
Unknown	Unknown	B.C., OR, CO	Causes curling of host leaves	Furniss & Carolin 1977
Unknown	Unknown	Eastern CAN to Alberta	Minor pest	Ives & Wong 1988
CA	1866	SC to FL, west to CA	Unknown	Milne & Milne 1980
CT	1946	CT, RI, NY, NJ, PA, spreading rapidly	Serious pest of red pine	Drooz 1985
Unknown	Unknown	Unknown	Unknown	Schwenke 1972
Unknown	1914	Unknown	Potential serious pest	Ferris 1953
Unknown	Unknown	Northeastern and midwestern U.S.	Can kill young plants	Drooz 1985
Unknown	Unknown	ME to TN, west to IL	Unknown	Drooz 1985
Unknown	Unknown	ME to MA	Unknown	Drooz 1985
Unknown	Unknown	Eastern U.S., 2 western states	Pest of ornamentals	Drooz 1985
Monterey Co., CA	1991	CA	Unknown	Millers 1992
ME	1980	Unknown	Economic pest of fruit crops	Hoebeke & Wheeler 1983
Unknown	Unknown	Unknown	Unknown	Borror *et al.* 1989
Unknown	<1892	D.C., NY, B.C. to CA, UT	Insignificant	Wheeler 1992
Unknown	Unknown	Ont.	Unknown	Smith 1979
Unknown	Unknown	NY to MD, west to OH	Unknown	Smith 1979
New Haven, CT	1914	Eastern U.S., CAN	Minor pest	Drooz 1985
MA and RI	1932	Northeastern U.S., southeastern CAN	Serious in pine plantations	Drooz 1985
Ott.	1922	Manit., Nfdl. to PA, west to MN	Minor pest	Drooz 1985
NY	ca 1880	B.C., Nfdl. to NJ, west to MI	Unknown	Smith 1979
NJ	1925	Northeast U.S., southeast CAN	Minor pest	Drooz 1985
PA	1925	CT, NJ, PA, Ont.	Serious pest of red and white pine	Drooz 1985
Unknown	1974	AL, FL, GA	Attacks dead or weakened trees	Drooz 1985
Unknown	Unknown	Northeastern U.S., southeastern CAN, Great Lakes region	Attacks dead or weakened trees	Drooz 1985
Unknown	Unknown	Unknown	Unknown	Schwenke 1982
Unknown	Unknown	Nfdl., NY, TN	Unknown	Smith 1979
Unknown	Unknown	Nfdl. south to VA, west to B.C.	Pest of cultivated roses	Smith 1979
NY	1967	Unknown	Potential economic pest	Hoebeke & Wheeler 1983
Unknown	1799	U.S. and southern CAN	Serious pest	Drooz 1985
Unknown	Unknown	Ont., CT, NY, MD, MI, IL, AL	Minor pest	Smith 1979
Unknown	Unknown	Que.	Unknown	Smith 1979
B.C.	Unknown	MA, NY, Que., Ont., B.C., WA	Leaf skeletonizer of young trees	Furniss & Carolin 1977
Unknown	Unknown	Unknown	Unknown	Smith 1979
Unknown	Unknown	Southern CAN, northern U.S., UT, NM	Unknown	Drooz 1985
CT	<1862	Northern U.S., southern CAN	Serious pest	Drooz 1985
Unknown	1925	Southeastern CAN, northeastern U.S.	Unknown	Drooz 1985
Unknown	Unknown	Southern CAN, northern U.S. to NM	Occasionally defoliates alder	Drooz 1985
N.S.	1908	Northeastern U.S., eastern CAN	Minor pest	Drooz 1985
Ont.	1964	RI, CT, NY, PA, MD, Ont.	Pest in pear orchards	Smith & Middlekauff 1987

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Order:Family	Species name	Origin	Host plant	Guild	Phagy*
Tenthredinidae	Hoplocampa testudinea (Klug)	Europe	Amelanchier, Crataegus, Malus, Prunus, Pyrus	e1	o
Tenthredinidae	Macrophya punctumalbum (Linnaeus)	Europe	Fraxinus, Ligustrum	a1	o
Tenthredinidae	Messa hortulana (Klug)	Europe	Populus	a2	m
Tenthredinidae	Messa nana (Klug)	Europe	Betula	a2	m
Tenthredinidae	Nematus ribesii (Scopuli)	Europe	Ribes	a1	m
Tenthredinidae	Nematus salicisodoratus Dyar	Unknown	Populus, Salix	a1	o
Tenthredinidae	Pontania proxima (Lepeletier)	Europe	Salix fragilis, S. alba	d1	m
Tenthredinidae	Pristiphora abbreviata (Hartig)	Europe	Pyrus	a1	m
Tenthredinidae	Pristiphora erichsonii (Hartig)	Europe	Larix	a1	m
Tenthredinidae	Pristiphora geniculata (Hartig)	Europe	Sorbus	a1	m
Tenthredinidae	Profenusa thomsoni (Konow)	Europe	Betula	a2	m
Tenthredinidae	Trichiocampus viminalis (Fallen)	Europe	Populus, Salix	a1	o
Vespidae	Vespa crabro germana Christ	Europe	Hardwoods	b5	p
ISOPTERA					
Rhinotermitidae	Coptotermes formosanus Shiraki	Asia	Amelanchier, Malus, Sorbus	b6	p
LEPIDOPTERA					
Argyresthiidae	Argyresthia conjugella Zeller	Europe	Prunus	e1	o
Argyresthiidae	Argyresthia pruniella (Clerck)	Europe	Prunus	e1	m
Choreutidae	Choreutis (Eutromula) pariana (Clerck)	Europe	Betula, Crataegus, Malus, Prunus, Pyrus, Salix	a2	p
Coleophoridae	Coleophora fuscedinella (Zeller)	Europe	Alnus, Betula, Crataegus, Malus, Ulmus	a1	p
Coleophoridae	Coleophora laricella (Hubner)	Europe	Larix	a1	m
Coleophoridae	Coleophora serratella (L.)	Europe	Alnus, Betula, Malus	a2 a1	p
Coleophoridae	Coleophora ulmifolliela McDunnough	Europe	Ulmus	a2	m
Cossidae	Zeuzera pyrina (Linnaeus)	Europe	Acer, Fagus, Fraxinus, Populus, Quercus, Ulmus	b2 b4	p
Gelechiidae	Anacampsis populella (Clerck)	Unknown	Populus	a1	m
Gelechiidae	Anarsia lineatella Zeller	Europe	Prunus	b2 e1	m
Gelechiidae	Dichomeris marginella (Fabricius)	Europe	Juniperus	a1	m
Gelechiidae	Exoteleia dodecella (Linnaeus)	Europe	Pinus	h2	m
Gelechiidae	Recurvaria nanella Hubner	Europe	Crataegus, Malus, Prunus, Pyrus	h2 a1	o
Geometridae	Chloroclystis rectangulata (Linnaeus)	Europe	Crataegus, Malus, Prunus, Pyrus	a1	o
Geometridae	Ennomos alniaria L.	Europe	Alnus, Betula	a1	o
Geometridae	Erannis defoliaria	Europe	Hardwoods such as Betula, Fagus	a1	p
Geometridae	Eulithis mellinata Fabricius	Europe	Ribes	a1	m
Geometridae	Hemithea aestivaria Hubner	Europe	Betula, Crataegus, Quercus	a1	p
Geometridae	Operophtera brumata (Linnaeus)	Europe, Africa	Acer, Populus, Quercus, Salix, Tilia, Ulmus	a1 e3	p
Geometridae	Thera juniperata Linnaeus	Europe	Juniperus	a1	m
Gracillariidae	Caloptilia negundella (Chambers)	Europe	Acer negundo	a1	m
Gracillariidae	Gracillaria (Caloptilia) syringella (Fabr.)	Europe	Euonymus, Fraxinus, Ligustrum, Syringa	a2	p
Gracillariidae	Phyllonorycter blancardella (Fabricius)	Europe	Crataegus, Malus	a2	o

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First found	Date	N. Amer. distribution	Pest status	Source
NY	1939	Northeastern U.S., B.C.	Pest in apple orchards	Smith & Middlekauff 1987
Unknown	1942	Ont.	Unknown	Smith 1979
Unknown	1924	MA	Unknown	Smith 1979
ME and NY	1966	Northeastern U.S., Ont., Que.	Unknown	Rose & Lindquist 1982
Unknown	1896	Que., Ont., DC, OH, IL, MO, KS, CO, OR	Unknown	Smith 1979
Unknown	Unknown	Southeastern CAN to GA, west to UT, CO and MT	Occasionally serious defoliator	Smith 1979
Unknown	Unknown	Ont., ME, NY	Unknown	Smith 1979
Unknown	<1896	CT to VA, west to KS, Ont., Pacific Northwest, CO, UT, CA	Pest of commercial pear	Smith 1979
Unknown	1880	Nfdl. to AK, midwestern U.S., MT, ID, OR	Very serious pest	Drooz 1985
Haines Falls, NY	1926	Northeastern U.S., Nfdl. to Ont.	Pest of ornamentals	Drooz 1985
Unknown	1960	ME, VT, CT, Ont., Que.	Unknown	Drooz 1985
Unknown	<1888	CAN, northern U.S.	Pest of ornamentals	Drooz 1985
Unknown	<1859	Northeastern U.S.	Minor pest	Drooz 1985
Houston, TX	1965	LA, SC, TX	Unknown	Drooz 1985
Unknown	Unknown	Northeastern U.S.	Unknown	NAIAD
Unknown	Unknown	Unknown	Pest of commercial fruit crops	Carter 1984
NY	1917	VI to IN, north to southern CAN, CO, OR	Unknown	Drooz 1985
ME	1927	Northeastern U.S., southeastern CAN	Serious defoliator	Gillespie & Gillespie 1982
MA	1886	Northeastern U.S., eastern CAN, WA, ID, MT	Defoliates larch, serious pest	Furniss & Carolin 1977
Ont.	1885	Northeastern U.S., N.B., N.S., Ont., B.C.	Serious pest of commercial fruit crops	Rose & Lindquist 1982
NY	1901	Northeastern U.S., southern Ont.	Minor pest	Drooz 1985
Unknown	Unknown	Philadelphia, PA north to MA	Serious pest of ornamentals	Drooz 1985
Unknown	Unknown	Nfdl.	Unknown	Rose & Lindquist 1982
NY	1872	U.S., B.C., Ont.	Serious pest of fruit crops	Gillespie & Gillespie 1982
NY	1910	U.S. and CAN	Serious pest	Drooz 1985
Niagara Peninsula, Ont.	1928	Southern Ont.	Kills buds on young trees	Rose & Lindquist 1973
Eastern U.S.	1776	N.S., Ont., eastern U.S.	Pest of apple orchards	Gillespie & Gillespie 1982
N.S.	1970	Unknown	Pest of fruit crops	Hoebeke & Wheeler 1983
Unknown	Unknown	Unknown	Unknown	NAIAD, Skinner 1984
Unknown	Unknown	Southwest CAN	Unknown	Schwenke 1978
Unknown	1967	Unknown	Unknown	NAIAD
B.C.	1978	B.C.	Unknown	Gillespie & Gillespie 1982
N.S.	1930	N.B., N.S., P.E.I., OR, WA, B.C.	Severe defoliator in N.S.	Drooz 1985
Unknown	Unknown	ME, N.S., Ont.	Minor pest	NAIAD, Skinner 1984
Unknown	Unknown	Canadian prairie provinces and prairie states in U.S.	Minor pest	Furniss & Carolin 1977
Ont.	1923	Northeastern U.S., southeastern CAN	Pest of ornamentals	Furniss & Carolin 1977
Unknown	Unknown	Northeastern North America	Major pest	NAIAD

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Order:Family	Species name	Origin	Host plant	Guild	Phagy*
Limacodidae	Cnidocampa flavescens (Walker)	Asia	Acer, Betula, Malus, Populus, Quercus, Salix	a1	p
Lymantriidae	Euproctis chrysorrhoea (Linneaus)	Europe	Acer, Malus, Prunus, Pyrus, Quercus, Salix, Ulmus	a1	p
Lymantriidae	Leucoma salicis (Linnaeus)	Europe	Amelanchier, Crataegus, Populus, Quercus, Salix	a1	p
Lymantriidae	Lymantria dispar (Linnaeus)	Europe	Most hardwoods, some conifers	a1	p
Lymantriidae	Orgyia antiqua (Linnaeus)	Europe	Deciduous trees	a1	p
Momphidae	Chrysoclista linneella Clerck	Europe	Tilia	b3	m
Nepticulidae	Obrussa sericopeza (Zeller)	Europe	Acer platanoides	a3	m
Noctuidae	Amphipyra tragopinus L.	Europe	Prunus	a1	m
Noctuidae	Amphipyra tragopoginis Clerk	Europe	Crataegus	a1	p
Noctuidae	Noctua comes Hubner	Europe	Crataegus	a1	p
Noctuidae	Peridroma saucia (Hubner)	Europe	Wide variety of trees	a1 h2 e3	p
Noctuidae	Syngrapha interrogationis (Linnaeus)	Europe	Vaccinium	a1	m
Oecophoridae	Autosticha kyotensis (Matsumura)	Asia	Juniperus	Unknown	m
Oecophoridae	Cheimophila salicella (Hubner)	Europe	Acer, Alnus, Betula, Cornus, Kalmia, Salix, Vaccinium	a1	p
Oecophoridae	Endrosis sarcitrella (Linnaeus)	Europe	Ilex, Taxus	Unknown	p
Oecophoridae	Esperia sulphurella (Fabricius)	Europe	Quercus agrifolia	Unknown	m
Plutellidae	Homadaula anisocentra Meyrick	Asia	Albizia, Gleditsia	a1	o
Prodoxidae	Lampronia rubiella Bjerk.	Europe	Rubus	h1	m
Psychidae	Apterona crenulella (Bruand)	Europe	Artemisia, Cercocarpus, Prunus, Salix	a1	p
Pyralidae	Cadra cautella (Walker)	Europe	Juglans, Prunus, Punica, Pyrus	e1	p
Pyralidae	Ectomyelois ceratoniae (Zeller)	Africa	Phoenix	e1	m
Pyralidae	Eurrhypara hortulata L.	Europe, Asia	Ribes	a1?	m
Saturniidae	Samia cynthia (Drury)	Asia	Ailanthus, Prunus	a1	p
Sesiidae	Sesia apiformis (Clerck)	Europe	Betula, Fraxinus, Populus, Salix, Tilia	b4	p
Sesiidae	Synanthedon tipuliformis (Clerck)	Europe	Corylus, Euonymus, Ribes	b3	p
Tortricidae	Acleris comariana (Zeller)	Europe	Spirea	a1	m
Tortricidae	Acleris variegana (Denis & Schiff.)	Europe	Betula, Malus, Prunus, Pyrus, Quercus	a1	p
Tortricidae	Aethes rutilana (Hubner)	Europe	Juniperus, Pinus	a1	o
Tortricidae	Archips podana (Scopoli)	Europe	Amelanchier, Malus, wide range of deciduous trees	a1	p
Tortricidae	Archips rosana (Linnaeus)	Europe	Corylus, Ligustrum, Malus, Prunus, Ribes	a1	p
Tortricidae	Cacoecimorpha pronubana (Hubner)	Europe	Euonymus, Ligustrum, Malus, Rhododendron, Rubus	a1 h1	p
Tortricidae	Cnephasia longana (Haworth)	Europe	Conifers, hardwoods, shrubs	a1	p
Tortricidae	Croesia forsskaleana (Linnaeus)	Europe	Acer	a1	m
Tortricidae	Croesia holmiana (L.)	Europe	Crataegus, Cydonia, Malus, Pyrus, Rubus	a1	o
Tortricidae	Cydia molesta (Busck)	Asia	Malus, Prunus, Pyrus	b1 e1	o

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First found	Date	N. Amer. distribution	Pest status	Source
Boston, MA	1906	Eastern MA	Unknown	Drooz 1985
MA	1897	Cape Cod, MA and Portland, ME	Minor pest	Drooz 1985
Boston, MA and B.C.	1920	New England, Canadian Maritime Provinces, OR, WA, B.C., Que., N.F., N.S., N.B.	Defoliates ornamental poplars	Gillespie & Gillespie 1982
Boston, MA	1869	Northeastern U.S., southern Ont. and Que.	Unknown	Drooz 1985
Unknown	Unknown	Eastern U.S. and CAN	Unknown	Drooz 1985
NY	1928	NJ, MA	Unknown	Drooz 1985
CT	1930	ME	Minor pest	Drooz 1985
Unknown	Unknown	CAN, PA	Unknown	Gillespie & Gillespie 1982
Unknown	<1860	Unknown	Minor pest	Skinner 1984
Unknown	1985	Unknown	Minor pest	NAIAD, Skinner 1984
B.C.	1900	U.S. and CAN	Serious pest	Gillespie & Gillespie 1982
Unknown	Unknown	Que.	Unknown	Rockburne 1976
Unknown	1974	Unknown	Minor	NAIAD
Richmond, B.C.	1955	Unknown	Minor pest	Gillespie & Gillespie 1982
Unknown	Unknown	Unknown	Minor pest	NAIAD
Unknown	Unknown	Unknown	Unknown	NAIAD
Washington, DC	1942	Midwestern and southern U.S.	Serious defoliator	Drooz 1985
Unknown	Unknown	Unknown	Unknown	Davis 1987
CA	1940	CA, NV, UT, ID	May be serious	Furniss & Barr 1975
Unknown	Unknown	Unknown	Damages stored nuts	NAIAD
Coachella Valley, CA	ca 1982	CA	Pest of date and almond crops	Warner *et al.* 1990
Unknown	1907	Eastern CAN, B.C.	Unknown	Gillespie & Gillespie 1982
Unknown	ca 1870	Eastern U.S., southern CAN	Pest in northern Great Plains	Drooz 1985
Unknown	1880	Northeastern U.S., CA	May kill young trees	Drooz 1985
Unknown	Unknown	Unknown	Unknown	Schwenke 1974
B.C.	1973	B.C.	Minor pest	Gillespie & Gillespie 1982
Victoria, B.C.	1920	B.C., WA, OR, CA	Unknown	Gillespie & Gillespie 1982
Unknown	1878	Southern CAN, New England, NJ, IN, OH	Minor pest	Gillespie & Gillespie 1982
Vancouver, B.C.	1937	B.C., Ont.	Minor pest	Gillespie & Gillespie 1982
Unknown	Unknown	Ont., N.S., B.C., WA, OR, CT, NY, NJ	Unknown	Gillespie & Gillespie 1982
Unknown	Unknown	OR	Unknown	Carter 1984
OR	1929	CA, OR, WA, B.C.	Pest in plantations	Furniss & Carolin 1977
Unknown	Unknown	Unknown	Unknown	NAIAD
B.C.	1877	B.C.	Potentially serious pest	Gillespie & Gillespie 1982
Unknown	Unknown	Unknown	Pest in fruit orchards	NAIAD

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Order:Family	Species name	Origin	Host plant	Guild	Phagy*
Tortricidae	Cydia pomonella (Linnaeus)	Europe	Crataegus, Juglans, Malus, Pyrus	e1	p
Tortricidae	Ditula angustiorana (Haworth)	Europe	Larix, Malus, Picea, Pinus, Prunus, Quercus, Taxus	a1 e3 b1	p
Tortricidae	Epiblema cynosbatella (L.)	Europe	Deciduous forest trees, fruit trees, ornamentals	a1	p
Tortricidae	Epinotia nanana (Treitschke)	Europe	Picea	a2	m
Tortricidae	Epinotia solandriana (L.)	Europe	Alnus, Betula, Populus, Salix	a1	p
Tortricidae	Grapholita molesta (Busck)	Europe	Prunus, Pyrus, Rosa	b1 e1	o
Tortricidae	Hedya nubiferana (Haworth)	Europe	Alnus, Betula, Malus, Prunus, Quercus, Salix	h2	p
Tortricidae	Pandemis cerasana (Hubner)	Europe	Acer, Alnus, Malus, Picea, Pinus, Quercus, Tsuga	h2 a1	p
Tortricidae	Pandemis heparana (Denis & Schiff.)	Europe	Betula, Lonicera, Malus, Prunus, Pyrus, Salix	a1 e3	p
Tortricidae	Rhopobota naevana (Hubner)	Europe	Crataegus, Ilex, Vaccinium	a1	p
Tortricidae	Rhopobota unipunctana Haworth	Europe	Ilex, Prunus spinosa	a1	p
Tortricidae	Rhyacionia buoliana (Denis & Schiff.)	Europe	Abies, Pinus	h2	o
Tortricidae	Sparganothis pilleriana (Denis & Schiff.)	Europe	Pinus, Prunus, Pyrus, Rubus	h2 a1 e3	p
Tortricidae	Spilonota lariciana (Heinemann)	Europe	Larix	a2	m
Tortricidae	Spilonota ocellana (Denis & Schiff.)	Europe	Crataegus, Larix, Malus, Prunus, Pyrus, Quercus	h2 a1 e3	p
Yponomeutidae	Argyresthia conjugella	Europe	Malus, Sorbus	e1	o
Yponomeutidae	Argyresthia pruniella	Europe	Prunus	e1	m
Yponomeutidae	Ocnerostoma piniariella Zeller	Europe	Pinus	a2	m
Yponomeutidae	Swammerdamia caesiella	Europe	Prunus spinosa	a1	m
Yponomeutidae	Swammerdamia lutaria	Europe	Crataegus, Sorbus	a1	o
Yponomeutidae	Yponomeuta malinellus	Europe	Malus	a1	m
Yponomeutidae	Yponomeuta padella (Linnaeus)	Europe	Malus, Prunus	a1	o
ORTHOPTERA					
Gryllotalpidae	Gryllotalpa gryllotalpa (Linnaeus)	Europe	Nursery stock	g1	p
PSOCOPTERA					
Elipsocidae	Cuneopalpus cyanops (Rostock)	Europe	Conifers	Unknown	o
THYSANOPTERA					
Phlaeothripidae	Nesothrips brevicollis (Bagnall)	Asia	Palmae	c1	o
Thripidae	Taeniothrips inconsequens Uzel	Europe	Acer, hardwoods	c1	p
Thripidae	Thrips calcaratus Uzel	Europe	Tilia, hardwoods	c1	p
Thripidae	Tmetothrips subapterus (Haliday)	Europe	Lonicera caprifolium, Robinia pseudoacacia	c1	o

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First found	Date	N. Amer. distribution	Pest status	Source
Unknown	1635 ?	Apple growing regions of U.S. and CAN	Pest in apple orchards	Miller 1987
Victoria, B.C.	1924	B.C., CA	Uncommon	Gillespie & Gillespie 1982
Ladner, B.C.	1978	B.C.	Unknown	Gillespie & Gillespie 1982
MA	1907	Ont., Que., northeastern U.S.	Unknown	Drooz 1985
B.C.	1909	CAN, WA, northeastern U.S.	Unknown	Martineau 1984
Washington, DC	ca 1912	Peach growing regions of U.S., B.C., Ont.	Pest in fruit orchards	Miller 1987
N.S.	1913	B.C., N.S., Ont., P.E.I., northeastern U.S.	Pest of apple orchards	Carter 1984
B.C.	1964	B.C.	Unknown	Furniss & Carolin 1977
Fraser Valley, B.C.	1978	B.C.	Unknown	Gillespie & Gillespie 1982
Unknown	Unknown	Found wherever hosts occur	Serious pest	Gillespie & Gillespie 1982
Unknown	Unknown	Unknown	Unknown	NAIAD
Long Island, NY	1914	Northeast U.S., southern CAN, WA, OR, B.C.	Now controlled by parasites	Drooz 1985
Unknown	Unknown	Unknown	Unknown	Carter 1984
Unknown	Unknown	Great Lakes to Atlantic seaboard	Minor pest	Rose & Lindquist 1980
MA	1841	Northern U.S., southern CAN	Orchard pest	Drooz 1985
Unknown	Unknown	Unknown	Unknown	Carter 1984
Unknown	Unknown	Unknown	Unknown	Carter 1984
Ithaca, NY	1882	Ont., Que, B.C., MT	Minor pest	Furniss & Carolin 1977
Unknown	1950's	Unknown	Unknown	Schwenke 1978
Unknown	1950's	Unknown	Unknown	Schwenke 1978
NY	1910	Eastern U.S.	Defoliates host	Parrott & Schoene 1912
Unknown	1909	Eastern U.S.	Defoliates host	Parrott & Schoene 1912
Unknown	Unknown	East coast of U.S.	Pest in nurseries	Drooz 1985
NY	1950	Unknown	Unknown	Hoebeke & Wheeler 1983
Unknown	1971	Unknown	Unknown	Frank & McCoy 1991
CA	1904	CAN and U.S.	Major pest	Nakahara 1991
NY	1925	Northern U.S. and CAN	Defoliates basswood trees	Raffa 1991
PA	1975	Unknown	Minor pest	Hoebeke & Wheeler 1983

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1994. **Immigrant phytophagous insects on woody plants in the United States and Canada: an annotated list**. Gen. Tech. Rep. NC-169. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 27 p.

Nearly 2,000 foreign plants and 2,000 foreign insect species have become naturalized in North America during the past 500 years. This publication documents those immigrant phytophagous insect species which have become established on woody plants or their products in the continental United States and Canada. Of these 368 immigrant insects, 72 percent came from Europe.

KEY WORDS: Introduced insects, exotic insects, biodiversity, competition, invasion ecology.

Our job at the North Central Forest Experiment Station is discovering and creating new knowledge and technology in the field of natural resources and conveying this information to the people who can use it. As a new generation of forests emerges in our region, managers are confronted with two unique challenges: (1) Dealing with the great diversity in composition, quality, and ownership of the forests, and (2) Reconciling the conflicting demands of the people who use them. Helping the forest manager meet these challenges while protecting the environment is what research at North Central is all about.